

How to Multiply & Divide Rational Numbers

Key #11

****Note: The rules for multiplying and dividing integers are identical, which makes it a lot easier than other operations. Also, always multiply or divide as usual. The rules only tell us if the sign of the answer will be positive or negative. Everything else is the same!!!*

Rules for determining the sign of the answer...

- When the signs are the same, the sign will be positive.
- When the signs are different, the sign will be negative.
- Examples are below:
 - ✓ $-2\frac{1}{2} \times -5 = \underline{12\frac{1}{2}}$
 - ✓ $-2\frac{1}{2} \times 5 = \underline{-12\frac{1}{2}}$
 - ✓ $2\frac{1}{2} \times -5 = \underline{-12\frac{1}{2}}$
 - ✓ $2\frac{1}{2} \times 5 = \underline{12\frac{1}{2}}$
 - ✓ $-12.5 \div -5 = \underline{2\frac{1}{2}}$
 - ✓ $-12.5 \div 5 = \underline{-2\frac{1}{2}}$
 - ✓ $12.5 \div -5 = \underline{-2\frac{1}{2}}$
 - ✓ $12.5 \div 5 = \underline{2\frac{1}{2}}$

When multiplying more than two integers, multiply pairs of numbers to simplify.

- Examples are below:
 - ✓ $-4 \times -5 \times -3 = \underline{-60}$
 - ✓ $-\frac{1}{2} \times 6 \times -1 = \underline{3}$
 - ✓ $3 \times -5 \times -2 = \underline{30}$
 - ✓ $-3.5 \times -4 \times -1 = \underline{-14}$
 - ✓ $-5 \times -2 \times -1 \times -1 = \underline{10}$
 - ✓ $-2 \times -2 \times -2 \times -2 \times -2 = \underline{-32}$
 - ✓ $4 \times -1 \times 2 \times -2 \times -3 = \underline{-48}$
 - ✓ $(-1)^{16} = \underline{+1}$

The Distributive Property and Rational Numbers.

When using the distributive property, BE CAREFUL whenever there are negative numbers involved!!! Remember, to distribute the negative throughout the entire set of parentheses. Let's simplify these using the distributive property PROPERLY!!!

$2x - (4x + 1)$ $2x - 4x - 1$ $\underline{-2x - 1}$	$-3x - 2(x - 5)$ $-3x - 2x + 10$ $\underline{-5x + 10}$
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Practice Problems

1. At lunch time, Benjamin often borrows money from his friends to buy snacks in the school cafeteria. Benjamin borrowed \$0.75 from his friend Clyde five days last week to buy ice cream bars. Represent the amount Benjamin borrowed as the product of two rational numbers; then, determine how much Benjamin owed his friend last week.

$$5(-0.75) = \underline{\underline{-3.75}}$$

$$5 \cdot \frac{3}{4} = \frac{15}{4} = 3\frac{3}{4}$$

Ben owes Clyde ★
\$3.75

2. Monica regularly records her favorite television show. Each episode of the show requires 3.5% of the total capacity of her video recorder. Her recorder currently has 62% of its total memory free. If Monica records all five episodes this week, how much space will be left on her video recorder?

$$(3.5)(5) = 17.50$$

$$62 - 17.50 = 44.5$$

Monica has ★
44.5% capacity
left.

3. In one year, Melinda's parents spend \$2,640.90 on cable and internet service. If they spend the same amount each month, what is the resulting monthly change in the family's income? Round your answer to the nearest penny!

$$12 \overline{) 2640.900}$$

$$\underline{-2400} $$

$$240 $$

$$\underline{-240} $$

$$000$$

$$\underline{-60} $$

$$40$$

\$220.08

★
Melinda's parents
pay \$220.08
per month!